

The restriction requirement is traversed. The Examiner asserts that the claimed product can be made by a different process, such as the polymer layers and titanium oxide layers could be layered by adhesively bonding one to the other instead of by alternatively soaking a substrate in a titania sol and a cationic polymer solution. Such hypothetical presumption clearly is not warranted when, as so disclosed in the specification, only the claimed method is suitable and effective for the preparation of the multilayer of the thin film of the elected claims, other known methods not providing for such structure. In any event, upon allowance of the elected claims, rejoinder of the nonelected claims which depend on the elected claims is requested, consistent with MPEP §821.04.

With regard to the rejection of the claims under 35 U.S.C. §103 as being unpatentable over Endo et al or Ogata, these rejections clearly have become moot due to the incorporation of the limitation of Claim 3 into Claim 1, Claim 3 not having been so rejected.

As to the rejection of the claims under 35 U.S.C. §103 over Oishi et al, it is traversed, particularly in view of the amendment to the claims.

The invention relates to a multilayer ultrathin film which comprises layers consisting essentially of polymer layers and layers of lamina particles alternately assembled, said lamina particles being obtained by exfoliating microcrystals of a layered titanium oxide, a film thickness of the layer being controlled within a range of from sub-nm to nm.

As so acknowledged and stated by the Examiner, Oishi et al do not disclose that their functional film comprises alternating layers of the polymer and the titanium oxide particles, asserting, however, that such modification would be obvious. Clearly, such is not the case. The titanium oxide particles in the structure of Oishi et al must contain the fine particles

being homogeneously dispersed in an inorganic thin film. As so stated by patentees at column 3, lines 39-43:

Thus, it is very important that fine particles are homogeneously dispersed in an inorganic thin film. In this respect, according to the present invention, it has been found out that fine particles can be homogeneously dispersed in an inorganic thin film by the above-described process.

In the claimed invention, on the other hand, the alternating layers consist essentially of lamina particles and layers of a polymer, the lamina particles not being dispersed in a polymer, but, rather, forming alternate layers with the polymer layers. Clearly, distinctly different structures are involved. The disclosure by patentees at column 3, lines 57-61, referred to by the Examiner, manifestly relate to layer of fine particles homogeneously dispersed in an organic thin film being formed on the surface of an organic film, not of a distinct layer consisting essentially of lamina particles on a polymer layer which lamina particles are not dispersed in a polymer layer.

Further, as so disclosed by Oishi et al in the paragraph bridging columns 2 and 3, a sol-gel method using light irradiation must be used, such resulting in a homogeneous dispersion of the fine particles in the inorganic thin film. In the claimed invention, on the other hand, a completely different and nonanalogous method is used for the claimed of the thin film. Consequently, such also resulting in a completely different and nonanalogous structure.

Further, and in any event, the fine particles in Oishi et al are not of a size ranging from sub-nm to nm, specifically from 0.5 nm to 2 nm, or 1 nm, they evincing thicknesses of 800-1,000 Å, i.e., 80-100 nm.

Accordingly, withdrawal of the rejection of the claims under 35 U.S.C. §103 is requested.

It is submitted that this application is now in condition for allowance and which is solicited.

Respectfully submitted,

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IN THE CLAIMS

--1. (Amended) A multilayer ultrathin film which comprises layers consisting essentially of [a] polymer layers and layers of lamina particles alternately assembled, said lamina particles [are] being obtained by exfoliating microcrystals of a layered titanium oxide, a film thickness of the layer being controlled within a range of from sub-nm to nm.--

3. (Canceled).

--5. (Amended) A method for producing the titania ultrathin film as defined in Claim 1, which comprises repeatedly soaking a substrate alternately in a sol having titania nanosheets suspended and in a cationic polymer solution so that the nanosheets and the polymer are adsorbed on the substrate each in a thickness of from sub-nm to nm level to form a multilayer having said components alternately accumulated.--

Claims 6-16 (New).